



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,103	06/25/2001	Takahiro Ishizuka	003510-099	7294

7590 11/24/2003

Platon N. Mandros  
BURNS, DOANE, SWECKER & MATHIS, L.L.P.  
P.O. Box 1404  
Alexandria, VA 22313-1404

EXAMINER

SHOSHO, CALLIE E

ART UNIT

PAPER NUMBER

1714

DATE MAILED: 11/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/887,103

Applicant(s)

ISHIZUKA, TAKAHIRO

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-7,9-11,13-17,19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,9-11,13-17,19 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. All outstanding rejections are overcome by applicants' amendment filed 8/21/03.

The new grounds of rejection as set forth below are necessitated by applicants' amendment and thus, the following action is final.

**Claim Rejections - 35 USC § 103**

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 3-7, 9-11, 13-15, 17, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. (U.S. 5,302,654) in view of Miyabayashi et al. (U.S. 6,204,307), Breton et al. (U.S. 6,384,108), and either JP 03231975 or Suzuki et al. (U.S. 5,508,421).

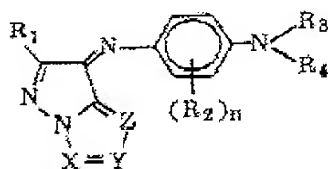
Ishii et al. disclose water-based ink jet ink used in ink jet printer to form images wherein the ink comprises colored particulates containing oil-soluble dye and block copolymer which has number average molecular weight of 1,000-10,000 and is formed from hydrophobic segment which is obtained from only hydrophobic monomers such as (meth)acrylates and from hydrophilic segment which is obtained from only hydrophilic monomers such as (meth)acrylic acid. The colored particulates are made by emulsification wherein water is added to organic solvent phase containing block copolymer and dye. The colored particulates have particle size of 0.01-1  $\mu\text{m}$  or preferably 164-290  $\mu\text{m}$ . The ink contains solvent such as ethylene glycol monoalkyl ether which is well known, as disclosed by Miyabayashi et al. (col.10, lines 34-47), as

a high boiling point solvent (col.1, lines 10-11, 16-17, and 50-57, col.2, lines 6-30, col.3, lines 14-16, 43-46, and 49-56, col.4, lines 11-13, col.5, lines 5-10, and col.8, lines 23-25).

The difference between Ishii et al. and the present claimed invention is the requirement in the claims of (a) specific type of oil-soluble dye, (b) amount of ionic group in the block copolymer, and (c) amount of colored particulates present in the ink.

With respect to difference (a), Ishii et al. disclose colored particulates comprising oil-soluble dye, but there is no disclosure of specific oil-soluble dye as presently claimed.

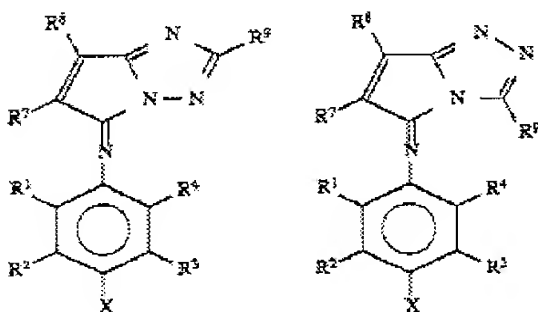
JP 03231975 is drawn to ink jet inks and discloses oil-soluble dye of the formula:



wherein R<sub>3</sub> and R<sub>4</sub>, which correspond to presently claimed R<sup>4</sup> and R<sup>5</sup>, are each hydrogen, alkyl, cycloalkyl, aralkyl, or aryl group, R<sub>2</sub>, which corresponds to presently claimed R<sup>2</sup> or R<sup>3</sup>, is hydrogen, cyano, alkyl, alkoxy, aryl, amino, or halogen, R<sub>1</sub>, which corresponds to presently claimed R<sup>63</sup> (see formula Cp-4, Cp-5, and Cp-6 in present claim 3), is hydrogen, alkyl, aryl, or amino, X and Y are independently either -CR<sub>5</sub>= or -N=, where R<sub>5</sub>, which corresponds to presently claimed R<sup>64</sup>, R<sup>65</sup>, or R<sup>66</sup> (see formula Cp-4, Cp-5, and Cp-6 in present claim 3), is hydrogen, alkyl, aryl, or heterocyclic, group, and presently claimed B<sup>1</sup> is =C(R<sup>6</sup>)- and B<sup>2</sup> is -

C(R<sup>7</sup>)= wherein R<sup>6</sup> and R<sup>7</sup> are each hydrogen (abstract and claim 1). The motivation for using such dye is to produce a printed image with good hue (page 6, first full paragraph).

Alternatively, Suzuki et al. disclose the use of oil-soluble dyes of the formula:



wherein X is -OH or -NR<sup>5</sup>R<sup>6</sup> where R<sup>5</sup> and R<sup>6</sup>, which correspond to presently claimed R<sup>4</sup> and R<sup>5</sup>, are each hydrogen, alkyl group, aryl group, or heterocyclic group, R<sup>4</sup> and R<sup>3</sup> which correspond to presently claimed R<sup>2</sup> and R<sup>3</sup>, are each hydrogen, aryl, alkyl, cyano, carbamoyl, cyano, sulfamoyl, or nitro group, R<sup>7</sup> which corresponds to presently claimed R<sub>87</sub>, is carbamoyl, alkoxycarbamoyl, or cyano, and R<sup>8</sup> and R<sup>9</sup> which correspond to presently claimed R<sub>88</sub> and R<sub>89</sub>, respectively, are each hydrogen, aryl, alkyl, cyano, carbamoyl, cyano, sulfamoyl, or nitro group (see formula Cp-18 and Cp-19 in present claim 3), and presently claimed B<sup>1</sup> is =C(R<sup>6</sup>)- and B<sup>2</sup> is -C(R<sup>7</sup>)= wherein R<sup>6</sup> and R<sup>7</sup> are each hydrogen (col.3, lines 38-67, col.4, lines 12-29, col.6, line 42-col.7, line 57, col.9, lines 12-52, col.10, lines 14-30, and col.13, lines 3-5 and 21-23). The

motivation for using such dyes is that they possess high absorption and high fastness to light and heat (col.2, lines 7-10 and col.3, lines 14-21).

With respect to difference (b), Ishii et al. disclose that the block copolymer is obtained from hydrophilic monomer including those containing ionic group such as acrylic acid, however, there is no disclosure regarding the amount of ionic group present.

Breton et al., which is drawn to ink jet ink comprising colored particles of an emulsifiable ionic polymer containing dye, disclose using 2.5-15 mol% hydrophilic monomer in the polymer in order to control the particle size of the polymer (col.4, lines 21-27).

In light of the motivation for using specific dye disclosed by JP03231975 or Suzuki et al. as described above as well as the motivation for using specific amount of hydrophilic monomer disclosed by Breton et al. as described above, it therefore would have been obvious to one of ordinary skill in the art (i) to use such dye in the ink of Ishii et al. in order to produce ink which produces printed image with good hue, or alternatively, to produce ink with high fastness to light and heat and (ii) to control the amount of hydrophilic monomer and thus, ionic group, in the block copolymer of Ishii et al. to amounts including that presently claimed in order to produce block polymer with suitable particle size, and thereby arrive at the claimed invention.

With respect to difference (c), Ishii et al. is silent with respect to the amount of colored particulates present in the ink.

However, given that the colored particulates are used to color the ink and given that the color strength, shade, density, etc. are all important ink properties, it would have been within the skill level of, as well as obvious to, one of ordinary skill in the art to choose amounts of colored

particulates, including that presently claimed, in order to produce an ink with the desired color strength, shade, density, etc., and thereby arrive at the claimed invention.

4. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. in view of Miyabayashi et al., Breton et al., and either JP 03231975 or Suzuki et al. as applied to claims 1, 3-7, 9-11, 13-15, 17, 19, and 21 above, and further in view of Meyrick et al. (U.S. 6,406,526).

The difference between Ishii et al. in view of Miyabayashi et al., Breton et al., and either JP 03231975 or Suzuki et al. and the present claimed invention is the requirement in the claims of the amount of block polymer which is used with respect to the amount of oil-soluble dye.

Meyrick et al., which is drawn to ink jet ink comprising colored polymer, disclose that the amount of dye and polymer present in the ink will vary according to the depth of shade required, typically in ratio of 1:1 to 15:1 (col.9, lines 34-38 and 60-67).

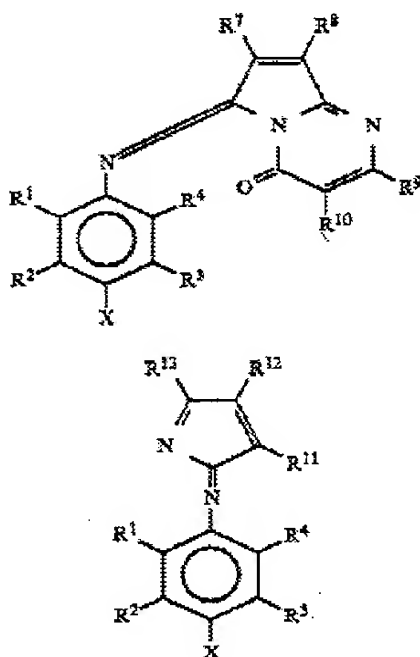
In light of the motivation for using specific ratio of polymer and dye disclosed by Meyrick et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such amounts of polymer and dye in the colored particulates in the ink of Ishii et al. in order to produce ink with desired color, and thereby arrive at the claimed invention.

5. Claims 1, 3-7, 9-11, 13-15, 17, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. (U.S. 5,302,654) in view of Miyabayashi et al. (U.S. 6,204,307), Breton et al. (U.S. 6,384,108), and Mikoshiba et al. (U.S. 5,344,933).

The difference between Ishii et al. and the present claimed invention is the requirement in the claims of (a) specific type of oil-soluble dye, (b) amount of ionic group in the block copolymer, and (c) amount of colored particulates present in the ink.

With respect to difference (a), Ishii et al. disclose colored particulates comprising oil-soluble dye, but there is no disclosure in either reference of specific oil-soluble dye as presently claimed.

Mikoshiba et al. disclose ink suitable for use in ink jet printing wherein the ink comprises oil-soluble dye identical to that presently claimed wherein the dye is one of the following:



where X, which corresponds to presently claimed A is  $-\text{OH}$  or  $-\text{NR}^5\text{R}^6$  where R<sup>5</sup> and R<sup>6</sup>, which correspond to presently claimed R<sup>4</sup> and R<sup>5</sup>, are each hydrogen, alkyl, aryl, or heterocyclic group,



$R^3$  and  $R^4$ , which correspond to presently claimed  $R^2$  and  $R^3$ , are each hydrogen, halogen, alkyl, aryl, cyano, etc., presently claimed  $B^1$  is  $=C(R^6)-$  and  $B^2$  is  $-C(R^7)=$  wherein  $R^6$  and  $R^7$  are each hydrogen,  $R^7$ ,  $R^8$ ,  $R^9$ ,  $R^{10}$ , which correspond to presently claimed  $R_{91}$ ,  $R_{92}$ ,  $R_{93}$ , and  $R_{94}$ , respectively, are each hydrogen, alkyl, aryl, cyano, etc. (see formula Cp-21 in present claim 3), and  $R^{11}$ ,  $R^{12}$ , and  $R^{13}$ , which correspond to presently claimed  $R_{84}$ ,  $R_{83}$ , and  $R_{82}$ , respectively, are each hydrogen, aryl, alkyl, aryl, alkoxy, etc., (see formula Cp-16 in present claim 3) (col.2, lines 55-68, col.3, lines 1-25, col.3, line 65-col.4, line 13, and col.40, line 59).

The motivation for using such dye is that the dye has high fastness in heat, light, moisture, air, and chemicals and is inexpensive and easy to synthesize (col.2, lines 10-15).

With respect to difference (b), Ishii et al. disclose that the block copolymer is obtained from hydrophilic monomer including those containing ionic group such as acrylic acid, however, there is no disclosure regarding the amount of ionic group present.

Breton et al., which is drawn to ink jet ink comprising colored particles of an emulsifiable ionic polymer containing dye, disclose using 2.5-15 mol% hydrophilic monomer in the polymer in order to control the particle size of the polymer (col.4, lines 21-27).

In light of the motivation for using specific dye disclosed by Mikoshiba et al. as described above as well as the motivation for using specific amount of hydrophilic monomer disclosed by Breton et al. as described above, it therefore would have been obvious to one of ordinary skill in the art (i) to use such dye in the ink of Ishii et al. in order to produce ink which possesses high fastness in heat, light, moisture, air, and chemicals and (ii) to control the amount of hydrophilic monomer and thus, ionic group, in the block copolymer of Ishii et al. to amounts

including that presently claimed in order to produce block polymer with suitable particle size, and thereby arrive at the claimed invention.

With respect to difference (c), Ishii et al. is silent with respect to the amount of colored particulates present in the ink.

However, given that the colored particulates are used to color the ink and given that the color strength, shade, density, etc. are all important ink properties, it would have been within the skill level of, as well as obvious to, one of ordinary skill in the art to choose amounts of colored particulates, including that presently claimed, in order to produce an ink with the desired color strength, shade, density, etc., and thereby arrive at the claimed invention.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. in view of Miyabayashi et al., Breton et al., and Mikoshiba et al. as applied to claims 1, 3-7, 9-11, 13-15, 17, 19, and 21 above, and further in view of Meyrick et al. (U.S. 6,406,526).

The difference between Ishii et al. in view of Miyabayashi et al., Breton et al., and Mikoshiba et al. and the present claimed invention is the requirement in the claims of the amount of block polymer which is used with respect to the amount of oil-soluble dye.

Meyrick et al., which is drawn to ink jet ink comprising colored polymer, disclose that the amount of dye and polymer present in the ink will vary according to the depth of shade required, typically in ratio of 1:1 to 15:1 (col.9, lines 34-38 and 60-67).

In light of the motivation for using specific ratio of polymer and dye disclosed by Meyrick et al. as described above, it therefore would have been obvious to one of ordinary skill

in the art to use such amounts of polymer and dye in the colored particulates in the ink of Ishii et al. in order to produce ink with desired color, and thereby arrive at the claimed invention.

#### **Response to Arguments**

7. Applicants' arguments regarding Yanagi et al. (U.S. 5,631,309) have been fully considered but they are moot in view of the discontinuation of this reference against the present claims.

8. Applicants' arguments filed have been considered. Applicants argue that in light of the amendment to the present claims filed 8/21/03, the present claims are no longer anticipated by Ishii et al. or obvious over Ishii et al. in view of the previous combinations of references set forth in the office action mailed 2/21/03.

It is agreed that the amendment filed 8/21/03 overcome all the rejections of record which is why the present claims are now rejected only under 35 USC 103 using Ishii et al. in view of various combinations of references to meet the limitations of the presently amended claims.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

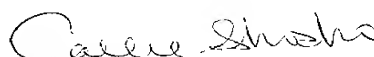
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho  
Primary Examiner  
Art Unit 1714